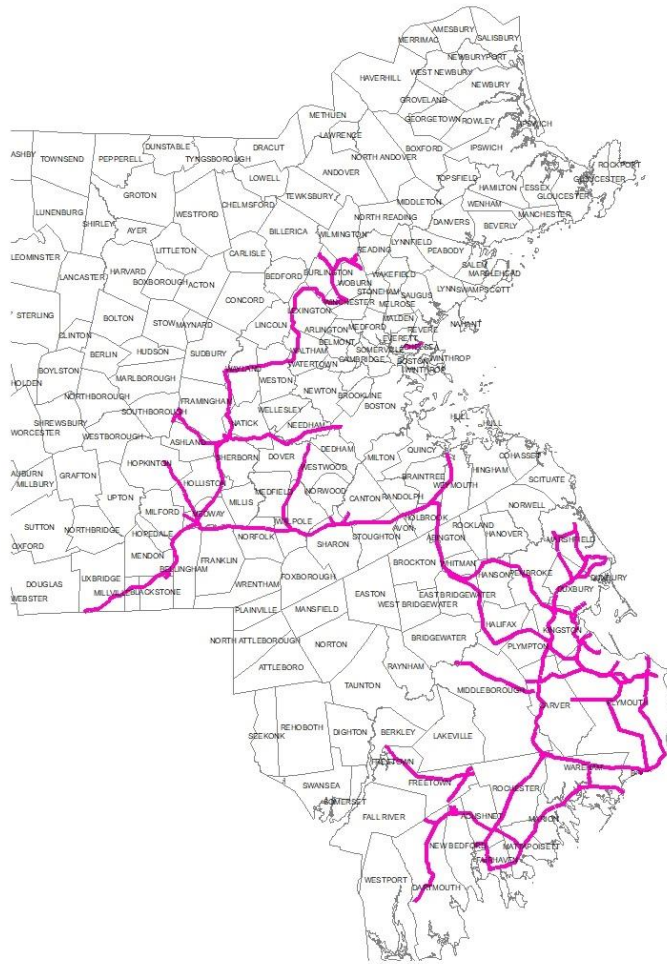




EVERSOURCE ENERGY, EASTERN MA
FIVE YEAR VEGETATION MANAGEMENT PLAN FOR
CENTRAL, EASTERN AND SOUTHEASTERN MASSACHUSETTS
2018-2022



Submitted by:
Eversource Energy, Eastern MA

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1. INTRODUCTION

Eversource Energy, Eastern MA (Eversource) hereby submits this Vegetation Management Plan (VMP) in compliance with 333 CMR 11.00, *Rights of Way Management* regulations (Appendix 3).¹ 333 CMR 11.01(1) this VMP “Ensures that an Integrated Pest Management (IPM) approach to vegetation management is utilized on all rights-of-way covered by 333 CMR 11.00.” Under ANSI 300 part 7, the American National Standards Institute (ANSI) defines IPM as IVM or Integrated Vegetation Management.

Eversource Energy, Eastern MA delivers electricity to approximately 1.1 million electric customers in 81 municipalities. Electricity transmitted over hundreds of miles of distribution and transmission rights-of-way (ROW) throughout the central, eastern, and southeastern regions of Massachusetts (Appendices 1 & 2).

Eversource is committed to managing vegetation at all of its facilities in a safe, environmentally responsible and efficient manner in full compliance with a vast array of state and federal laws and regulations. In this effort, Eversource is responsible for maintaining its ROWs free from hazards and encroachments. Vegetation is one of the items that can interfere with electric service. Following industry standards for electric power lines, the end result of the Eversource vegetation management program is the appropriate early successional (low growing) ecological communities on its ROWs that do not interfere with the delivery of safe and reliable energy products to every customer.

Eversource’s program by design reduces the amount of herbicides used; using selective herbicides/application techniques at the lowest effective labeled rate; timing applications for maximum effect; avoiding fixed application schedules; using mechanical control techniques where appropriate, and encouraging low growing plant communities that supports nature’s ability to regulate itself by inhibiting the germination and growth of

¹A partial list of the regulations that Eversource must comply with that relate to the activities in this document also include: Chapter 132 B, Pesticide Control Act (Appendix 4); all pertinent clauses in Chapter 85 of the Acts of 2000 (Appendix 8); MESA; MGL c.131, Massachusetts Endangered Species Act and its regulations, 321 CMR 10.00, Massachusetts Endangered Species Regulations; 310 CMR 10.00, *Wetlands Protection Regulations*; 310 CMR 22.00, Drinking Water regulations; Chapter 216, *An Act Relative to the Emergency Service Response of Public Utility Companies*; NERC Standard FAC-003-1, *Commissioner Order 69*, and all applicable Federal Occupational Safety and Health Act, Department of Transportation and Department of Environmental Protection regulations.

tree seedlings through competition (for light, moisture, nutrients) and depredation of wildlife (browsing/feeding). This program allows for the safe delivery of reliable electric service while minimizing the impact on property owners and supports a healthier, more diverse habitat for wildlife that depends upon early successional landscapes.



Illustration 1: Grasslands Habitat in a Barrens Ecosystem

2. GOALS AND OBJECTIVES

Eversource has a regulatory obligation to maintain the property under its electric powerlines that it either owns in fee or has an easement right to maintain to ensure the safe and reliable delivery of electric power to its customers. To achieve this goal, Eversource has prepared this VMP as the guidance document that explains the most appropriate practices and procedures to manage incompatible vegetation on ROWs while reducing the risk of unreasonable adverse effects to the health and well-being of humans, animals and the environment.

Eversource's VMP outlines and explains the standards of vegetation control expected from a carefully planned IVM program. It serves as an educational and communication link for state and municipal officials and the public. With professionalism and courtesy on the part of Eversource and field personnel, this objective will be accomplished through the VMP, Yearly Operational Plans (YOPs) and notification processes required by 333 CMR 11.00 and for Transmission Lines under Chapter 216, *An Act Relative to the Emergency Service Response of Public Utility Companies*.

The following are individual objectives of Eversource's vegetation management program:

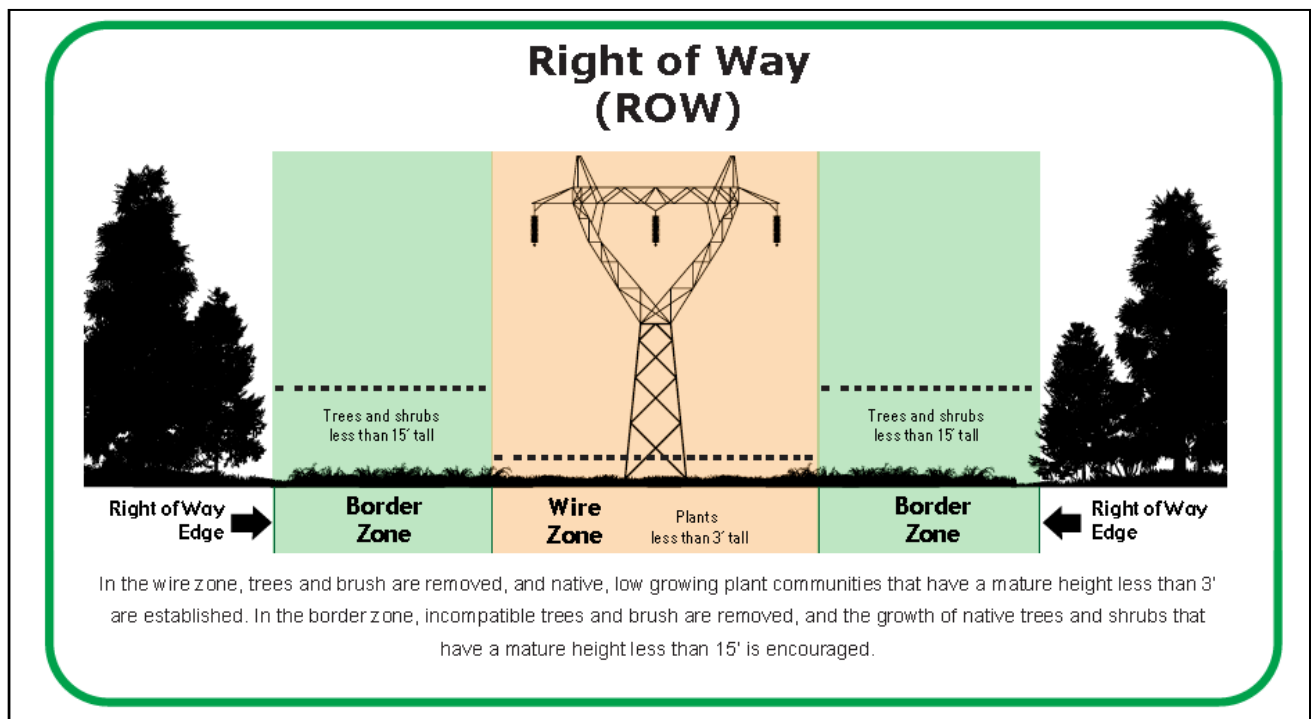
- To maintain ROWs that ensures the safe and dependable delivery of energy products;
- To control vegetation that impedes ground and aerial inspections or interferes with the ability to access the ROWs and structures for maintenance or emergencies;
- To encourage stable early successional ecological communities of primarily low growing plant communities;
- To utilize an IVM program on a three to five-year cycle designed to maximize control of incompatible vegetation on the full width of the ROWs;
- To remove or control incompatible vegetation on the ROWs, along access roads, around structures, gates and the perimeter of electric substations;
- To encourage the establishment of wildlife habitat that is compatible with and does not interfere with the primary function of the ROWs;
- To protect the Priority Habitat of State-Listed species;
- To control invasive, and poisonous plant species;

- To follow all *sensitive areas* restrictions listed in 333 CMR 11.04;
- To ensure that all vegetation management operations are conducted in a safe, effective manner and in conformity with all federal and state laws, regulations, and permit conditions;
- To use experienced, trained vegetation management personnel with Massachusetts pesticide applicator licenses working under the direct supervision of a certified pesticide applicator;
- To maintain the flexibility necessary to accommodate unique situations and the need for more appropriate techniques in accordance with new regulations, scientific advances, operational experience and/or comments from municipalities, state agencies and contractors (when necessary, following the procedures in 333 CMR 11.05(4)(d)),
- To present a clear, constructive explanation of Eversource's vegetation maintenance program to external stakeholders including abutting landowners, state and municipal officials, contractors and the public.

3. IDENTIFICATION OF INCOMPATIBLE VEGETATION

EVERSOURCE ELECTRIC ROWs

Pursuant to the policy and intent set forth in Eversource's VMP, all vegetation must be removed that obscures the ROW corridors and grows tall enough to interfere with the safe, efficient and legal operation of an electrical power line. In the wire zone, trees and brush are targeted, and native, low growing plant communities that have a mature height less than 3' are established. In the border zone, incompatible trees and brush are targeted, however, where appropriate native trees and shrubs that have a mature height less than 15' may be encouraged (see illustration 2).



Following this industry standard border zone, wire zone approach to ROW management, the primary target vegetation is all incompatible tree species (woody vegetation with a mature height greater than 15' tall at maturity); except those species that are under the purview of the Natural Heritage and Endangered Species Program of the Massachusetts Division of Fisheries and Wildlife (NHESP) which will be treated on a

case by case basis. Purely as an explanatory guide for external stakeholders, examples of incompatible tree species include, but are not limited to:

| | | |
|-------|---------|-----------|
| Alder | Cherry | Pine |
| Aspen | Hemlock | Maple |
| Beech | Hickory | Oak |
| Birch | Locust | Sassafras |

Significantly more compatible vegetation species thrive on an Electric ROW than incompatible. In fact, ROW's are one of the primary early successional plant communities remaining in New England. As a result, many plant and animal species use ROWs as their homes, feeding grounds or nurseries. Certain plant species, therefore, are generally encouraged on the ROW through the use of an IVM program:

- Most herbaceous growth is acceptable and encouraged.
- Shrubs that mature less than 15 feet in height are not usually incompatible *unless* due to their location or attributes they interfere with the function of the ROW.

Certain categories of non-tree species may be incompatible because of their location and/or their nature. Dense woody vegetation, shrubs and vines are incompatible where they are capable of interfering with the inspection and maintenance of the poles, wires, and along access roads, paths and gates which need to be kept clear, especially for emergencies. Additionally, as will be discussed below, invasive, poisonous and nuisance plant species are incompatible.

Again, as a guide to external stakeholders, examples of non-tree species generally considered incompatible, include, but are not limited to:

| INVASIVES | | |
|------------------|-------------------|----------------------|
| Autumn Olive | Japanese Knotweed | Multiflora Rose |
| Buckthorn | Honeysuckle | Oriental Bittersweet |
| Greenbriar | | |
| OTHER | | |
| Blackberry | Hawthorne | Sumac |
| Grapevines | Poison Ivy | Virginia Creeper |

INVASIVE, POISONOUS PLANTS AND NUISANCE PLANT SPECIES

Eversource intends to control invasive, poisonous and nuisance plant species with herbicides and mechanical treatment methods. Invasive plant species have become an increasing concern throughout Massachusetts in areas that include ROW corridors where they can spread rapidly and move into the adjacent landscape. Eversource also plans on treating poisonous and nuisance plant species at sites on its ROWs identified as having a high risk of posing a health hazard to individuals working on or traversing a ROW and that can impede a rapid response in an emergency.

Invasive Plant Species

The control of invasive plant species is of growing concern in Massachusetts. Many of these non-native plant species were planted for their showy flowers, vigorous growth, erosion control and abundant fruits that attract wildlife (not all introduced species are defined as "invasive"). According to the Massachusetts Invasive Plant Advisory Group "Invasive plants" are non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems....

Recognizing this serious threat to our environment, Eversource's IVM program takes into account the control of invasives using both mechanical and/or chemical control techniques, as necessary in specific locations. Some examples commonly found on ROWs include, but are not limited to:

| | | |
|------------------|-------------------|----------------------|
| Autumn Olive | Honeysuckle | Oriental Bittersweet |
| Black Locust | Japanese Knotweed | Phragmites |
| Glossy Buckthorn | Multiflora Rose | Purple Loosestrife |

Poisonous Plants

Massachusetts, particularly the southeast, has an abundant population of poison ivy and other poisonous plants. This poses a health hazard to Eversource personnel, contractors and the public-at-large. Mechanical methods do not reduce the spread of these populations—particularly poison ivy—therefore Eversource plans to use herbicides to

spot treat poisonous plants at sites identified as having a high risk of posing a health hazard.

Nuisance Vegetation

Nuisance vegetation is plant species that pose a risk to the safety and health of individuals working on or traversing a ROW and it can impede a rapid response in an emergency. These plants have heavy thorns, dense foliage and/or impenetrable stems (many are also invasive plant species); examples include, but are not limited to blackberries, raspberries, grapevines and a number of invasive plant species such as Multiflora Rose. Eversource plans to use a combination of mechanical and chemical treatment methods to reduce their spread.

IDENTIFICATION METHODS DURING VEGETATION MANAGEMENT ACTIVITIES

To ensure the accurate identification of compatible and incompatible vegetation, all vegetation management contractors are required to supply personnel trained to recognize plant species typically found growing on utility sites and to recognize the difference between compatible and incompatible vegetation; including the ability to identify the appropriate early successional communities preferred on electric ROWs.

4. INTEGRATED VEGETATION MANAGEMENT

333 CMR 11.01(1) requires that all right-of-way managers “Ensure that an Integrated Pest Management (IPM) approach to vegetation management is utilized on all rights-of-way....” The purpose in implementing the vegetation control program in this VMP is to advance the consistent and safe operation of Eversource’s ROWs through the use of the appropriate industry standard IVM program. Eversource’s IVM program will use all appropriate IVM methods available including: mechanical, chemical, cultural and biological control methods. Mechanical and chemical control methods facilitate development of a low-growing plant community that in time will become the biological control over the plant community.

Eversource’s IVM takes into consideration all factors involved in the maintenance and operation of electric ROWs. Eversource has applied a structured decision- making process to construct this IVM program that combines:

- An understanding of the conditions existing on its ROWs;
- An understanding of federal and state regulatory mandates that dictate what vegetation is compatible or incompatible on its ROWs;
- The regulatory agencies mandated goals and objectives of utility ROW vegetation management;
- The most current treatment methods;
- The intent to prevent unreasonable adverse effects to the environment and the safety and health of non-target organisms;
- The economic effects of the treatment both for Eversource and their customers, including the need to delivery energy products safely and economically,
- And above all monitoring and the ability to adapt the program to both current and arising ecological conditions.²

Eversource looks to the longest, most respected and benchmark study of the use of IVM on Electric ROWs for the foundation of its IVM program. Scholars have studied various research plots on Pennsylvania ROWs (popularly known as the “Bramble and

²Christopher A. Nowak & Benjamin D Ballard. “A Framework for Applying Integrated Vegetation Management on Rights-of-Way.” *Journal of Arboriculture* 31(1) (January 2005): 28-37.

Burns” studies) for the past sixty-years. In this continuous study the working definition of IVM is:

...elimination of target [incompatible] trees (undesirable tree species, e.g., tall, rapid-growing trees that eventually may cause a power outage) via herbicide or mechanical means.... [and the] development of a tree-resistant plant cover type that eliminates or delays invasion of target [incompatible] trees on the ROW.³

There is no single definition of IVM that suits every situation and every entity. According to the United State Environmental Protection Agency, Office of Pesticide Programs:

“[Utility] Integrated Vegetation Management (IVM) is generally defined as the practice of promoting desirable, stable, low-growing plant communities.... These methods include a combination of chemical, biological, cultural, mechanical, and/or manual treatments.... Each IVM program is designed around individual goals, needs, and resources.... Consequently, every IVM program is unique.”⁴

Eversource’s IVM program follows a New England conditions based variation of the ANSI Standards 300, Part 7 *Integrated Vegetation Management*. It is a combination of herbicide (chemical methods) applications and mechanical (mechanical—hand held and large equipment—methods) treatments that support the ability of early successional ecological communities to regulate themselves (natural/biological methods) by inhibiting the germination and growth of tree seedlings through competition (for light, moisture, nutrients), depredation of wildlife (browsing/feeding) and other ecosystem processes.⁵ It also takes into consideration compatible land uses that eliminate the need to control incompatible vegetation such as parks, lawns, pastures, etc. (cultural methods).

On its own, and without following a treatment cycle that utilizes chemical and mechanical methods every three to five years, the natural/biological method is not a permanent solution as plant life is by its nature unstable, it is, however, governed by the

³Richard H. Yahner “State Game Lands 33 Research and Demonstration Project—57 years of Continuous Study on the Shawville to Lewiston 230-kV line of First Energy (Penelec). 2009: 9; Yahner. “2009 Annual Report to Cooperators. Green Lane Research and Demonstration Project: 23 Years of Continuous Study.” (2009): 8; Yahner. “Wildlife Response to More than 50 years of Vegetation Maintenance on a Pennsylvania U.S., Right-of-Way.” *Journal of Arboriculture* 30(2) (March 2004): 123

⁴United States Environmental Protection Agency. “Fact Sheet: Integrated Vegetation Management.” EPA 731-F-08-010 (Oct. 2008).

⁵Yahner. “Wildlife Response to More than 50 years of Vegetation Maintenance on a Pennsylvania U.S., Right-of-Way”: 123.

relatively predictable process of change in composition or structure of ecological succession. In New England, succession strives towards the mature (climax) forest, but is interrupted by natural or man-made disturbances both intentionally and accidentally. Utility IVM programs are an intentional man-made disturbance that supports the need to deliver energy products by encouraging early successional ecological communities. This is achieved by discouraging the establishment of and when necessary removing certain types of vegetation. Eversource's approach reduces the amount of herbicide used; using selective herbicides/application techniques; timing applications for maximum effect; avoiding fixed application schedules; using mechanical control techniques where appropriate, and encouraging low growing plant communities.

Mechanical and chemical controls are the direct techniques used to target incompatible vegetation and include mowing, hand-cutting and herbicide applications. Utilizing these direct techniques allows, lower growing native plants the opportunity to form healthy ecological communities. Allowing for the regeneration of low growing native plants is a vital part of any successful Utility IVM program because native plants have a much better chance for survival, especially during adverse growing conditions; planted vegetation often fails due to site-species incompatibility.

In an IVM program, these native early successional ecological communities lower the dependence on chemical and mechanical controls. At the same time, discouraging succession relies on selective chemical and mechanical treatments. All three depend upon the others in a continuous cycle that employs the unique advantages of each. Without combining all three, incompatible plant species develop increased stem densities that require more intense control measures, and ecological succession continues its path to the mature forest.

IVM allows for treatment cycles to be lengthened with fewer incompatible species on the ROW that require control. There is sixty years' worth of evidence in New England showing that this approach has actually, over time, significantly reduced the per-acre application rate of herbicides on utility ROWs and reduced the need for intensive mechanical controls.⁶ Following this approach the company has over time, reduced the

⁶Environmental Consultants, Inc. "Study of the Impact of Vegetation Management Techniques on Wetlands for Utility Rights of Way in the Commonwealth of Massachusetts." Final report prepared for

per-acre application rate of herbicide mixes. Our rights-of-way were once dominated by high stem densities of incompatible tree species in a mechanical program only. Since implementing the 5- year Vegetation Management Plans using IVM based program has resulted in the average rate per acre of applied herbicide mixes starting at approximately three gallons (24 pints). ROW's that have IVM cycles using selective herbicide applications have had incompatible woody stem densities reduced and a more diverse desirable vegetation cover, resulting in average rate per acre at approximately 1-1½ (8-10 pints) gallons per acre. Today many of the companies ROW's have little mechanical control necessary on the floor as there are fewer incompatible species on the ROW that require control. The mechanical control efforts are being to be concentrated in side pruning and removing trees at the easement edges of the ROW.

5. MECHANICAL CONTROLS

Mechanical controls include hand cutting, mowing of brush, side pruning and removal of mature trees. The following section lists their uses and sets some basic guidelines.

HAND CUTTING

Definition:

The use of chainsaws and brush saws to remove the stem and/or branches from the plant's root system.

New England Electric et.al, 1989; Environmental Consultants, Inc. "Determination of the Effectiveness of Herbicide Buffer Zones in Protecting Water Quality on New York State Powerline Rights-of-Way." Final report for the Empire State Electric Energy Research Corporation, 1991; K.H. Deubert. "Studies on the Fate of Garlon 3A and Tordon 101 Used in Selective Foliar Application in the Maintenance of Utility Rights of Way in Eastern Massachusetts." Final Report prepared for New England Electric et.al., 1985; N.H. Nickerson, G.E. Moore and A.D. Cutter. "Study of the Environmental Fates of Herbicides in Wetland Soils on Electric Utility Rights-of-Way in Massachusetts over the Short Term." Final Report prepared for New England Electric et.al, December 1994; Matt Hickler, NHESP approved Review Biologist, Reports for TransCanada, National Grid, NSTAR Electric, and Northeast Utilities under 321 CMR 10.00 Massachusetts Endangered Species Act Regulations, 2006-2010; "Utility Transmission Forestry Herbicide Use Summary Records" for NSTAR Electric, Vermont Electric Power Company, TransCanada Hydro Northeast, Inc and National Grid USA Electric Companies (see National Grid 5 year VMP 2009-2013, p. 9); C.A. Nowak and L.P. Abrahamson, "Vegetation Management on Electric Transmission Line Rights-of-Way in New York State: The Stability Approach to Reducing Herbicide Use." Proceedings of the International Conference on Forest Vegetation Management, Auburn University, April 1993.

Uses:

- Incompatible vegetation 15' tall at maturity and over;
- Conifers exceeding 6' in height or all conifers in wetlands;
- In easement restricted areas;
- In chemical restricted sensitive areas;
- In visual buffers in conjunction with cut stump surface treatments (see below),
- Allows for selectivity in targeting incompatible vegetation.

Operational Practices:

- Trees are cut as close to the ground as possible so that stump height is no higher than root swell;
- Cut stems are windrowed and diced or chipped;
- Depending on the situation windrows are positioned parallel along the edge of the ROW corridor;
- Cut woody vegetation in yards or recreational sites will be chipped and disposed of, or removed to adjacent areas;
- Diced woody vegetation should not exceed 2 ft. in height;
- Larger trees are limbed and lopped;
- Cut woody vegetation is not left on or across paths, roads, fence lines, stone walls or in waterways or in such a manner that would permit it to wash into these areas;
- The placement of cut woody vegetation must comply with applicable State Fire Marshall's regulations;
- Chipping is used on sites designated by Eversource when dicing or piling is prohibited or impractical. When necessary, wood chips will be removed;
- No chips shall be left in wetlands,
- All cut cherry is removed from active pastures.

MOWING

Definition:

The cutting, severing or shattering of vegetation by large rotary or flail mowers. These heavy-duty mowers, usually ranging from 3-8 feet wide, are typically mounted on large four-wheel drive rubber tired tractors or tracked vehicles.

Uses:

- Can be the preferred mechanical technique, especially on sites where extremely tall and dense incompatible vegetation makes hand cutting inefficient and expensive;
- Where herbicides are prohibited,
- On non-restricted sites, mowing may be used to remove tall incompatible vegetation followed by herbicide treatment to the re-sprouts during the following growing season.

Operational Practices:

- Mowing may be restricted by terrain conditions such as steep, rocky sites or wet soils;
- It necessitates the use of hand cutting methods next to obstructions such as stone walls and fence lines;
- Mowing brush can throw large chips and debris great distances from the cutting equipment;
- Extreme care must be exercised to insure the safety of the general public,
- In populated areas it requires employing someone to prevent people and animals from coming too close to the work site.

SIDE PRUNING

Definition:

Side pruning or removal of encroaching tops and/or branches of trees growing on or near a ROW. This management technique is usually accomplished by the use of an aerial lift mounted on either a large truck or off-road vehicle. Tree climbing is sometimes employed in situations where terrain prevents the passage of equipment.

Uses:

- Maintaining the edge definition of the ROW corridor;
- Easier inspections of vegetation conditions during aerial patrols.

Operational Practices:

- All trimming activities are performed in accordance with proper arboriculture practices to insure the health and aesthetic value of the trees (see Operational Guidelines for Applicators);
- All trimming activities are in compliance with all current applicable regulations.

REMOVALS

Definition:

Removal of trees that have become a hazard to the ROW or that may have been overlooked in previous treatment cycles and allowed to encroach the ROW and the lines and conductors. In these cases, trees will be removed in such a way that they cannot strike wires, guy wires, structures, appurtenances and adjacent properties. In most cases these trees will be addressed using aerial lift equipment, but may require climbing where terrain dictates. Larger overhanging limbs may require rigging to safely control the fall of cut material. Trees that do not overhang or directly threaten the line may be “pieced down” by removing material from the top down in small sections that cannot strike the line or cause damage. In cases of severe encroachment on a larger scale, qualified and appropriate timber harvesting equipment and contractors may be employed to clear the ROW up to the edge of easement.

Uses:

- Maintaining the edge definition of the ROW corridor;
- Easier inspections of vegetation conditions during aerial patrols.

Operational Practices:

- All removal activities will be performed by qualified line clearance arborists;
- Care will be taken to accurately locate the bounds of activity, to minimize erosion and unnecessary hydrological damage due to ruts, and to minimize impact to the environment,
- Measures may include matting of wetland areas, installation of silt fences and chipping and removal of all debris.

6. MECHANICAL CONTROLS: BENEFITS AND LIMITATIONS

An IVM program does not function without mechanical controls. Between regulatory restrictions and the need to open access to treatment areas, chemical controls cannot work without mechanical controls. Likewise, mechanical controls and chemical controls work together to support the establishment and viability of early successional ecological communities and it takes all three components of an IVM program to support wildlife habitat.

In some areas, mechanical controls are the preferred method or only method; for example, the use of herbicides may be prohibited or restricted in various sensitive areas leaving mechanical treatment methods as the only options. These include defined distances around drinking water supplies both private and public, wetlands or water over wetlands, rivers, certified vernal pools, and agricultural or inhabited areas (see sensitive area section below). Certain Priority Habitats defined by NHESP call for the use of mowing instead of, or in conjunction with herbicide applications to encourage the health or restrict the height of various host plants.

Mechanical treatment methods are also used on vegetation over 15 feet in mature height in preparation for herbicide treatments; in individual areas deemed as sensitive; around structures; on access roads, to clear easements and in areas of thick impenetrable vegetation. Mechanical treatment methods may be combined with chemical controls, including foliar and cut stump treatments, to prevent re-sprouting. Alternately, where large areas of high density incompatible species have exceeded maximum herbicide treatment heights, a mechanical treatment may be more practical followed, in one or two growing seasons, by an herbicide application to obtain effective control. This includes along the easement edges where trees that exceed Eversource's ability to comply with federal regulations are cleared or trimmed.

Upon establishing the easement edge, the cleared area of the ROW is managed by the Wire Zone, Border Zone approach using the appropriate treatment methods, as, on their own mechanical controls are only a short-term solution to controlling vegetation on a ROW system. With the exception of most conifer species (pitch pine does re-sprout), cut vegetation re-sprouts from dormant buds on the root collar resulting in a stem density significantly greater than the original vegetation. An annual program that uses only

mechanical treatment cycles therefore generally increases dense areas of woody vegetation. This vegetation competes with and dominates the low growing vegetation Eversource wishes to encourage.

When relying on mechanical control methods alone, dense areas of incompatible vegetation also become costly and dangerous to hand-cut with power saws and are best controlled by mowing. Large mowing equipment, although an excellent IVM tool, can have a negative impact on compatible plant communities whose establishment is crucial to developing successful natural controls. The scarification of the soil surface also creates a potential seedbed for fast growing, pioneering incompatible species such as poplars, cherries, birches and various invasive species. This can increase the frequency of the maintenance cycle and destroy the dominance of stable, diverse early successional plant communities. Similarly, sensitive areas, such as wetlands and residential areas can be adversely impacted when crossed by mechanical maintenance equipment.

Mowers, chainsaws and brush saws also represent a higher risk to workers than herbicide applications.⁷ Mowing machines throw rocks and pieces of wood and objects great distances exposing both the workers and the public to safety risks from flying objects. No matter how carefully executed, at the conclusion of mechanical treatment operations, stumps are left on the ROW, which are a tripping hazards to both workers and the general public; they can also puncture tires and damage equipment.

All three components of an IVM program have their limitations. This is actually the strength of an IVM program. Understanding these limitation is just as important as understanding their strengths. The, when crafting an IVM program that suits the conditions of individual ROWs the limitations are restricted while the benefits can be utilized to meet the goals of reliability in the most responsible fashion possible.

⁷See Appendix 10.

7. CHEMICAL CONTROLS

Chemical controls are herbicide applications which include foliar, basal and cut stump surface treatments (CST), and plant growth regulator (PGR) applications. They are a vital year-round component of an IVM program in establishing and stabilizing early successional plant communities and the development of natural controls to maintain this goal. The following sections lists their uses and sets some basic guidelines.

GENERAL GUIDELINES

- An advance person or “prep-cutting” crew will patrol the ROWs before the herbicide application operation.
- Sensitive areas will be identified and appropriately measured and flagged, then verified and recorded when appropriate in cooperation with local water suppliers and conservation commissions.
- Herbicides will NOT be applied during the following adverse weather conditions:
 - ✓ During high wind velocity, per 333 CMR 11.03;
 - ✓ Foliar applications during periods of dense fog, or moderate to heavy rainfall per 333 CMR 11.03;
 - ✓ CST or basal applications during periods of heavy rainfall;
 - ✓ Foliar applications of volatile herbicides when temperatures exceed 89 degrees Fahrenheit and low humidity;
 - ✓ CST or Basal application when deep snow (i.e. 6” plus or ice frozen on stem or stump) prevents adequate coverage of incompatible species to facilitate acceptable control,
 - ✓ Basal applications when the stems are excessively wet from moisture.
- Herbicides are not applied:
 - ✓ To vegetation standing in surface water;
 - ✓ Within chemical restricted Sensitive Areas per 333 CMR 11.00,
 - ✓ To active pasture land unless arrangements are made with land owners to move livestock to an alternative location.
- All conifers over six feet tall will be controlled by cutting. Where appropriate, all pitch-pine stumps will be treated with an herbicide to prevent re-sprouts.

FOLIAGE APPLICATIONS

Definitions:

The application of herbicides to fully developed leaves, stems, needles or blades of a plant.

Low Volume Foliar:

Hand-operated pumps or motorized, backpack sprayers with herbicide concentrations per the manufacturers' label(s). The backpack sprayer produces an air current that delivers the herbicide mixture from the portable spray tank to the targeted vegetation. The hand sprayer uses a column of water. In both cases, the amount of herbicide solution applied only dampens or lightly wets the targeted vegetation, instead of being applied to the point of run-off. This minimizes the amount of excess herbicide drip from incompatible species onto desirable ground cover. Low volume applications also eliminate the need to bring heavy equipment on the ROW for the transportation of large quantities of herbicide solution.

Modified Low Volume Foliar:

Uniform, penetrating herbicide mixtures delivered to dense incompatible vegetation. This technique usually involves 200-500 gallon hydraulic sprayers mounted on a truck or tractor equipped with several hundred feet of hose and hand held spray guns. The herbicide mixture can be directed to specific plants for spot treatments or broadcast for uniform coverage in dense thickets of nuisance plants such as poisonous, or invasive plant species.

Uses:

- An economical and effective control method in medium and high brush densities
- Effective control of invasive, and poisonous vegetation.
- Contributes to establishing and stabilizing early successional plant communities.
- Allows for selectivity in targeting vegetation.

General Guidelines:

- Herbicides are mixed or diluted with water per label instructions;
- Herbicides are applied as a uniform spray over the entire plant's foliage;
- Low pressure foliar application equipment will be adjusted to apply a spray pattern that achieves effective control at the lowest application rate;
- Application period usually extends from early June through the beginning of leaf abscission in early fall;

- Anti-drift agents are added to the mix or solution in all foliage applications to reduce the potential of herbicide drift beyond targeted vegetation—drift control agents reduce the break-up of sprays into fine droplets and offer increased selectivity, leaf tissue penetration, and herbicide deposition on targeted vegetation;
- Foliar applications can be made, and are effective, in light mist conditions;
- When foliar applications are stopped by rainfall, treatment will not resume until the rain ends and is not actively running off the leaf surface,
- Foliage application operations cease in wind conditions that make it impossible to prevent herbicide movement beyond the target area.

LOW-VOLUME STEM BASAL

Definition:

The selective application of herbicides in an oil solution to the lower portion of the plant stem.

Uses:

- Year-round application technique, except during deep snow conditions that cover the target area;
- Typically employed during the non-foliage season when targeted stems are easier to identify without the interference of lush, tall grasses or ferns.

Guidelines:

- Utilizes hand-operated backpack sprayers;
- Utilizes special blended light petroleum oil as the diluent, enabling the herbicide solution to penetrate the bark tissue and translocate within the targeted vegetation;
- Not an appropriate method to control high stem densities due to high herbicide rates per acre and unreasonable labor costs;
- Extending the herbicide treatment period beyond the foliage season justifies using this technique for appropriate vegetation conditions,
- May be the appropriate choice for visually sensitive areas or where extreme selectivity is desirable.

CUT STUMP SURFACE TREATMENT (CST)

Definition:

The application of an herbicide mixture to the cut surface of a stump immediately following or during a cutting operation using an herbicide concentration, diluted in water or a non-freezing solution.

Uses:

- Year-round applications except during deep snow conditions that prevent cutting the stumps low enough;
- Offers the opportunity to chemically treat incompatible vegetation in sensitive areas where other methods are not possible,
- Commonly used to prevent re-sprouts when hand cutting vegetation.

Guidelines:

- Application equipment includes low-volume, backpack, hand-pump sprayers; hand held squirt bottles; paintbrushes, or sponge applicators;
- Only necessary to treat the phloem and cambium tissue, regardless of the stump diameter;
- Ideally, treatment should be made to freshly cut stumps;
- Best to avoid using it during the season of high sap flow,
- Not practical in moderate to heavy stem densities.

PLANT GROWTH REGULATORS (PGR)

Definition:

Tree Growth Regulators (TGRs) are plant growth regulator chemicals that manage or reduce the potential growth rate of trees.

Uses:

- Useful especially along street distribution lines where repetitive trimming is necessary to maintain adequate tree-wire clearances;
- Can lengthen the time frame between trimming cycles and improve the aesthetics of street and yard trees that may otherwise require removal or severe pruning.

Guidelines:

- Applied as basal drench around the base of the tree, or
- Applied as a soil injection next to the buttress root zone.

8. CHEMICAL CONTROLS: JUSTIFICATION, RATIONALE FOR USE AND GUIDELINES AS PART OF AN INTEGRATED VEGETATION MANAGEMENT PROGRAM

State and federal regulations require Eversource to deliver energy products to its customers in a safe and efficient manner and to control vegetation on its ROWs. To meet these obligations in an ecologically sound manner, as discussed above and according to a wide range of studies, is best completed by stabilizing early successional ecological communities on the ROWs.⁸ To do this, Eversource needs to use all the treatment methods available while encouraging the establishment or stability of a landscape that is both accessible and which supports the health and development of native plants and wildlife habitat.

In an IVM program, chemical controls are the ideal method to achieve long term vegetation control because the entire plant, including the roots, is controlled by the use of herbicides, stopping their spread by re-sprouts, adventitious root suckering and rhizomes. Eliminating the ability of the treated plants to return also increases the length of time between treatment cycles by reducing their recurrence and stem counts. This is achieved by scheduling herbicide applications to sustain acceptable vegetation control at minimal application rates.⁹ When all of these factors are taken into consideration herbicide applications can minimize the amount of manpower and equipment and their repeated impact on the environment, including the much greater potential for unintended petroleum and hydraulic fluid leaks from mechanical equipment.

The herbicide formulations are then applied selectively by low-volume methods that dry quickly on the plant surface, which significantly restricts the greatest potential for off-target exposure. Additionally, anti-drift adjuvants that can be adjusted to accommodate changes in wind velocity are included in all foliage applications to further

⁸Belisle, Francis. "Wildlife Use of Riparian Vegetation Buffer Zones in High Voltage Powerline Rights-of-Way in the Quebec Boreal Forest." 7th International Symposium on Environmental Concerns in Rights-of-Way Management, 1999; Confer, John L. "Management, Vegetative Structure and Shrubland Birds of Rights-of-Way," 7th International Symposium on Environmental Concerns in Rights-of-Way Management, 1999; CVPS. "Central Vermont Public Service Corporations 2006 Strategy; T&D Forestry," Rutland, VT, 2006; Niering, William A. "Roadside Use of Native Plants: Working with Succession, An Ecological Approach in Preserving Biodiversity." Roadside Use of Native Plants: http://www.environment.fhwa.dot.gov/ecosystems/vegmgmt_rdsduse.asp.

⁹*Utility Transmission Forestry Herbicide Use Summary Records*; Nowak & Abrahamson.

limit the likelihood of unintentional exposure to non-target organisms. Applications are also not made in situations when there is a reasonable expectation that herbicides will drift from the targeted vegetation, or during measurable precipitation.

For use within limited spray areas, the Massachusetts Department of Agricultural Resources, Pesticide Program (MDAR) established a *Sensitive Area Material List* to help reduce the potential of any negative impact by the use of herbicides in sensitive areas defined in 333 CMR 11.04. All of the herbicides on this list have gone through extensive testing to be considered for registration by Federal EPA and before being included on the *Sensitive Area Materials List* they go under further scrutiny by MDAR and Massachusetts Department of Environmental Protection.¹⁰

Selective herbicides applications do not adversely affect wetland plant composition or function according to the study cited in the *DFA Decision Concerning The Wetland Impact Study Conducted Pursuant to 333 CMR 11.04(4)(c)(2)*¹¹ (Appendix 7). In fact, according to the 1989 study by Environmental Consultants, Inc. quoted in the *Decision*, mechanical vegetation control techniques result in significantly greater impact on wetland composition and function.

Herbicide applications can be more selective than mechanical treatment methods. Selective herbicide applications encourage plant species diversity by targeting only incompatible vegetation for removal. They offer varied degrees of selectivity and favor certain types of plants; for example, broadleaf vegetation can be controlled with little or no impact to grasses. A continual cycle of selective herbicide applications as part of an IVM program, therefore, promotes low-growing plant communities while reducing the density of incompatible species.

Also, invasive, and poisonous plant species are best managed by early recognition and intervention with chemical controls before a little intrusion becomes a large infestation. A quick response with the flexibility to use the appropriate control methods will reduce the likelihood of severe infestations.

¹⁰A current list of the *Sensitive Area Materials List* and individual *Fact Sheets* on these herbicides are available at: <http://www.mass.gov/eea/agencies/agr/pesticides/rights-of-way-vegetation-management.html>.

¹¹ DFA is now MDAR.

Selective herbicide applications can be much less destructive than mowing to nesting sites and the vegetation necessary for food and cover. Little site disturbance is associated with selective herbicide applications. For example: to control the dense re-sprouts resulting from a mowing operation requires higher per acre rates of applied herbicide to achieve acceptable control than a selective herbicide/cutting application.

This is not to say that mowing is not an important component in an IVM program. Both control methods need to be used in combination with hand cutting techniques to cover all situations. In fact, thoughtful, carefully planned, selective herbicide applications in combination with mechanical controls, where appropriate, actually promote wildlife habitat by encouraging plant species diversity.¹²

Herbicide application equipment that is well maintained incorporating the most up-to-date features and the requirement that licensed contractors apply herbicides per label instructions minimizes environmental site damage. Herbicides, particularly when applied selectively by low-volume methods, dry quickly on the plant surface, thereby significantly restricting the greatest potential for dermal exposure. The use of anti-drift adjuvants in all foliage applications that can be adjusted to accommodate changes in wind velocity further limit the likelihood of unintentional exposure to non-target organisms.

The selection of the herbicides coupled with the appropriate treatment methods is made with consideration given to the environmental sensitivity of a ROW or site within a ROW. For example, incompatible species, such as non-sprouting conifers, are generally not treated since herbicide treatment is not necessary for control. Exceptions to this general guideline are made where White Pine regeneration has seeded in large thick “carpets” and mowing would be more destructive than an herbicide application.

The herbicides, applications and other treatment methods used on any given ROW are selected based on site sensitivity, species composition and density. Herbicides will not be used in certain areas if site sensitivity, regulations, new restrictions, or species composition or height require otherwise. Eversource chooses the most appropriate

¹²A short list of examples includes: W.C. Bramble and W.R. Burns. “A long-term ecological study of game food and cover on a sprayed utility right-of-way.” *Bulletin No. 918*, Purdue University (1974):16; Yahner. “Wildlife Response to More than 50 years of Vegetation Maintenance on a Pennsylvania U.S., Right-of-Way”: 123; James S. Marshall and L.W. Vandruff. *Impact of Selective Herbicide Right-of-Way Vegetation Treatment on Birds*. Environmental Management 30(6) (December 2002): 801-806.

treatment methods to meet all of its goals, objectives and obligations and the most scientifically sound, environmentally friendly solution is to use all three components of IVM where appropriate.

9. DEFINITION, IDENTIFICATION AND TREATMENT OF SENSITIVE AREAS

Per 333 CMR 11.02, sensitive areas are "any areas within rights-of-way...in which public health, environmental or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects." They include, but are not limited to, the following:

Water Supplies

- Zone I's.¹³
- Zone II's
- IWPA's (Interim Wellhead Protection Areas)
- Class A Surface Water Sources
- Tributaries to a Class A Surface Water Source
- Class B Drinking Water Intakes
- Private Wells.

Surface Waters

- Wetlands
- Water Over Wetlands
- The Mean Annual High Water Line of a River
- The Outer Boundary of a Riverfront Area
- Certified Vernal Pools.

Cultural Sites

- Agricultural Areas.
- Inhabited Areas.

Wildlife Areas

- Certified Vernal Pool Habitat
- Priority Habitat.

Sensitive areas consist of *no-spray areas* in which herbicide use is prohibited, *limited spray areas*, and areas that require special treatment recommendations (see below). Protecting all of these environmentally sensitive sites is accomplished by establishing limited spray and no-spray areas and treatment restrictions based on the

¹³ Eversource policy is to follow the strictest distance restrictions on Zone I's (400 feet) so that no mistakes are made on identifying well types.

sensitivity of each site and the requirement to minimize any unreasonable adverse impacts within that area (See Appendix 5).

The herbicides included in the *Herbicides Recommended for Use in Sensitive Areas List* (*Sensitive Area Materials List*) will be applied in limited spray areas according to the application restrictions in 333 CMR 11.04 or in the case of Priority Habitat, approval of the YOP by the Natural Heritage and Endangered Species Program of the Massachusetts Department of Fisheries and Wildlife (NHESP). A current copy of the *Sensitive Areas Materials List* and MDAR approved active ingredient fact sheets are available at:

<https://www.mass.gov/service-details/rights-of-way-vegetation-management-vmmps-yops-and-notices>

IDENTIFICATION OF SENSITIVE AREAS

Sensitive areas can be divided into two additional categories that help identify and treat them: “*readily identifiable in the field*” and “*not readily identifiable in the field*.” Readily identifiable in the field areas will be treated, identified and when appropriate, marked according to all applicable restrictions listed in 333 CMR 11.00. Not readily identifiable in the field areas will likewise be treated and marked when appropriate, but they are identified in the field by the use of data marked on maps and collected in the YOP and notification processes.

- Sensitive areas usually identifiable in the field, include but are not limited to: surface water, some private and public water supplies, wetlands, inhabited and agricultural areas.
- Sensitive areas not usually identifiable in the field, including, but are not limited to: designated public surface water supplies, public ground water supplies, some private drinking supplies, the first 400 feet of water supply tributaries, certified vernal pools and Priority Habitat of State-listed Species.

As appropriate, therefore, sensitive areas will be identified and when necessary marked in the field by Eversource staff, an experienced vegetation management treatment crew point person, individuals trained in the identification of sensitive areas that require the use of GIS (geographic information systems) and GPS equipment, and/or by a NHESP approved botanist trained in the delineation of state-listed species.

Eversource and contractor personnel assigned the task of identifying sensitive areas in the field will use the following sources and methods:

- Massachusetts Department of Environmental Protection water supply maps /GIS mapping layers available through Mass GIS;
- MDAR records of identified private wells along the ROW;
- Correspondence, meetings and input from municipalities within the forty-five day YOP and twenty-one day municipal right-of-way notification letter (including Board of Health, Conservation Commission, Public Water Supplier and Select Board/Mayor/Town Administrator) review and comment periods and the 48 hour newspaper notification (under 333 CMR 11.06 & 11.07 and Chapter 85 of the Acts of 2000);
- Correspondence, meetings and input from Eversource's abutter and/or landowner notification procedure, as applicable;
- Eversource's maps, records and institutional knowledge;
- Any additional pertinent information that becomes available during the YOP process and throughout the five years of this VMP;
- A point person who verifies identified sensitive areas and any additional areas that may require special precautions;
- United States Geological Survey topographical maps;
- Information from contractor's knowledge and records;
- Information from Mass GIS;
- Confidential information from NHESP;
- A copy of the YOP and VMP;
- Treatment crew(s) are required to have the following references on the job site to help identify sensitive areas:
 - ✓ Topographical maps (electronic or paper)
 - ✓ Copy of YOP
 - ✓ Any additional information that may become available.

Maps are a resource and a tool for both the public and the vegetation management crews, therefore, they contain the data needed to identify, mark and treat sensitive areas appropriately.

Maps included in the YOP are updated every year as new data becomes available. Some sensitive areas are contained on the base USGS topographic maps such as applicable Wetland Resource Areas (Rivers, Wetlands, etc.) The most current data available through MassGIS such as public water supplies, certified vernal pools, and any

data that Eversource has collected to date on items such as private wells are then added on top of the USGS data. At the time of treatment, additional sensitive areas will be added to the maps utilized by Eversource's vegetation management contractors. Please note that to enable any viewer to see the important information on the maps, Zone II's and other limited spray areas are not mapped in areas where Eversource only uses herbicides on the *DAR Rights-of-Way Sensitive Area Materials List*.

The locations of the Priority Habitats of state listed species as regulated by the NHESP of the Division of Fisheries & Wildlife are only included on field maps to contractors who sign a confidentiality agreement expressly for this purpose. A map layer of Priority Habitats is available to the general public at <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis> but it is neither specific to areas of concern for herbicide applications nor does it include data on the individual species since the exact location and details of their habitat is protected.

CONTROL STRATEGIES FOR SENSITIVE AREAS

Mandated sensitive areas will be treated following the restrictions in applicable state and federal regulations. Eversource also reserves the right to designate additional areas as areas that require special treatment considerations including, but not limited to, landowner agreements, visual or environmental impact considerations, and other considerations that arise during the treatment cycles.

Treatments in all sensitive areas will follow the operational guidelines and restrictions listed above, as well as the guidelines described in the Sensitive Area Table in Appendix 5.

Wetlands

Pursuant to 333 CMR 11.04 (4) (c) (2), based upon the results of two ROW wetland impact studies (see appendix 5), the MDAR in consultation with the Department of Environmental Protection and the Rights-of-Way Advisory Panel, made a determination that herbicides, when used at various utilities including electric lines, under the guidance of an IVM program and other conditions as set forth in the determination, have less impact on wetlands than mechanical only techniques. Therefore, in accordance with the conditions of the determination, Eversource will

selectively apply herbicides to wetland sites, except within ten feet of standing and flowing water and to conifers which will be cut (Appendix 5).

Public and Private Water Supplies

Appropriate sources and references will be consulted to determine the location of public and private water supplies. Eversource's YOP maps will include all known public and private water supplies at the time of printing using the sources listed above, and the mapping information used by contract treatment crews will be updated as necessary during the treatment cycle.

To aid in the public and private water supply identification process, under 333 CMR 11.01(3)¹⁴, Eversource requests that during the various federal, state and voluntary notification processes and during the treatment cycle, that public and municipal agencies and private entities and individuals share information on new or unidentified public and private water supplies.

Identified private drinking supplies within one hundred feet of a ROW are included in our permanent records and maps, and landowners are encouraged to post signs on the edge of the ROW to help identify private water supplies (the no-spray treatment area is fifty feet from a private well).

A point person will patrol the ROW to verify sensitive areas and buffers are appropriately measured and when applicable flagged, and recorded for permanent record.

Massachusetts Endangered Species Act

Eversource recognizes the importance of the Massachusetts Endangered Species Act, M.G.L.C. 131 A, and its significance to ROW vegetation management. Eversource will comply with all applicable portions of this Act and the regulations promulgated thereunder. Eversource will also follow the rules and prohibitions directed at human activities which Take Species or alter their Significant Habitat (as of this printing there are no designated Significant Habitat in Massachusetts).

¹⁴333 CMR 11.01(3): "[The Specific goals of 333 CMR 11.00 are to] Ensure ample opportunity for public and municipal agency input on potential impacts of herbicide application to rights-of-way in environmentally sensitive areas."

321 CMR 10.14, Massachusetts Endangered Species Act Regulations, Part II Exemptions and 333 CMR 11.04(3)(a-c) exempts utility ROW vegetation management from the permit process under the following conditions:

(12) The management of vegetation within existing utility rights-of-way provided that the management is carried out in accordance with a vegetation management plan approved in writing by the Division prior to the commencement of work for which a review fee shall be charged, the amount of which shall be determined by the commissioner of administration under the provisions of M.G.L. c.7, § 3B...

[and for roadside distribution lines]

(6) installation, repair, replacement, and maintenance of utility lines (gas, water, sewer, phone, electrical) for which all associated work is within ten feet from the edge of existing paved roads;

To comply with exemption 10.14(12), Eversource will submit this VMP and YOPs to the NHESP for review.

The NHESP has delineated areas as Priority Habitat based on the "Best Scientific Evidence Available" to protect State-listed species from a "take." Under the approval process, details about the Priority Habitat of state-listed species that might be affected by our activities and management recommendations are shared with Eversource under strict confidentiality agreements.¹⁵ Using this data and best management practices, Eversource and contract personnel will follow the appropriate vegetation management treatment methods within these sensitive areas taking all practical means and measures to modify ROW vegetation management procedures to avoid damage to state-listed species and their habitat.

To identify Priority Habitats, Eversource personnel, NHESP approved review botanists and vegetation management crews must use proper identification procedures. Contractors are, therefore, required to train their personnel to recognize the location of Priority Habitats using one of the following tools: paper maps, GPS coordinates and/or GIS systems.

¹⁵A map layer of Priority Habitat is available to the general public at <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis> , but it is neither specific to the areas of concern for herbicide applications nor does it have detailed data on the species of concern; the exact location and details of their habitat is kept confidential for their protection.

10. OPERATIONAL GUIDELINES FOR APPLICATORS RELATIVE TO HERBICIDE USE

Eversource relies on independent vegetation management contractors and requires that they comply with all applicable federal and state laws and regulations. This VMP, the YOPs and information in the notification documentation are the operational guidelines for applicators relative to herbicide use. Therefore, according to the regulations, at a minimum, the contractor's application crews shall have a copy of the YOP accessible at the work site.

In addition to the guidelines contained in other sections of the VMP, this section sets forth the general operational guidelines for vegetation management. All guidelines are based on the requirement that both the contractor(s) and Eversource are responsible to insure that vegetation management activities are conducted in a professional, safe, efficient manner, with special attention directed towards minimal environmental impact.

Eversource will alter or add to these guidelines based on possible future changes or additions to state and federal regulations that apply to herbicide applications and all changes or additions will be approved by MDAR.

EVERSOURCE PERSONNEL

- The following individual is responsible for monitoring, supervising and coordinating vegetation management programs (Eversource may direct contractors to communicate with other Eversource personnel):

William Hayes, Senior Arborist
Eversource Energy, Eastern MA
Transmission Vegetation Management
247 Station Drive, SE-370
Westwood, MA 02090-9230
781-441- 3932 (office)

- The arborist(s) will inform the contractor which ROWs will be treated, the range of treatment dates and any other specification required to complete the job.
- Eversource will provide ROW maps with treatment restriction lists and written instructions outlining any special treatment considerations or instructions.

- Contractors will notify the Eversource company representative(s) of any questions or complaints from the public and/or government agencies that relate to ROW vegetation management. Eversource will deal with these complaints or questions in a timely fashion.

CONTRACTOR SAFETY, CONTRACT AND LEGAL COMPLIANCE GUIDELINES

- Contractors must provide qualified, personnel who have been trained to recognize and identify compatible and incompatible vegetation and are knowledgeable in the safe and proper use of both mechanical and chemical vegetation management techniques.
- All personnel applying herbicides in Massachusetts must hold a pesticide applicator license and must work under the on-site supervision of a certified applicator, with a Category 40 certification.
- Herbicides will be handled and applied only in accordance with label instructions
- Mixing will not be done on the ROW.
- Contractors are not expected to start work without the appropriate maps, restriction lists, landowner notifications and mixing rate instructions.
- Contractors will be in compliance with the latest revisions of all industry standards including, but not limited to all applicable safety standards under the Occupational Safety and Health Act (OSHA) including 1910.269, Electric Power Generation, Transmission, and Distribution; ANSI Z133 & ANSI 300 standards, and Eversource Safety Procedures.
- All contract personnel will follow label instructions regarding Personal Protective Equipment (PPE).
- All contract personnel will follow Eversource's safety requirements as outlined in the Eversource Electric Transmission Vegetation Management Plan and Electric Distribution Vegetation Management Plan.
- Applicators will immediately cease operations if adverse conditions or other circumstances warrant.
- Access to a ROW will be through the use of established roadways whenever possible.
- All bar-ways and gates shall be immediately closed.
- Care shall be exercised to prevent the rutting or destruction of roadways, fields or any other form of access.
- No litter of any kind will be left on the ROW or adjoining land.

CONTRACTOR DAILY TASKS

- Call the appropriate Eversource personnel
- In compliance with both regulations and Eversource policy, the contractors' foreman or senior crew member must complete daily vegetation management reports that include:
 - ✓ Date, name and address of vegetation management contractor(s).
 - ✓ Identification of site or work area.
 - ✓ List of crew members.
 - ✓ Type of equipment and hours used, both mechanical and chemical
 - ✓ Method of application and description of incompatible vegetation
 - ✓ Amount, concentration, product name of herbicide(s), adjuvants and dilutants (EPA registration numbers must be on file).
 - ✓ Weather conditions.
 - ✓ Notation of any unusual conditions or incidents, including public inquiries.
 - ✓ Recording and/or verification of sensitive areas on ROW maps.
- All required forms will be distributed to the contractors by the Eversource representative(s).
- Eversource request that contractor(s) call if they see a hazard tree.
- Contractors must follow the Specifications noted in the RFP's.

EQUIPMENT

- Eversource will not dictate the exact equipment to be used by the contractors, instead, all equipment shall be of adequate design to produce professional quality results.
- Equipment must be maintained in good working condition, including being calibrated as appropriate.
- Care and common sense shall be exercised when moving vehicles and equipment.

LANDOWNERS

Landowners are individuals whose property is either under Eversource 's ROW easements and/or abuts the ROW.

- Landowners will be treated with courtesy and respect at all times.
- Permission must be obtained for ingress and egress if entering the ROW from private land.

- If a landowner demands vegetation maintenance cease, the contractor should remove the crew and equipment off the property, inform the appropriate Eversource representative as soon as possible and wait for clearance before returning to that location.
- When addressing serious complaints from a landowner, or other concerned person, notice will be sent to the appropriate authorities at MDAR.

RESULTS

- Vegetation management programs must result in 95% control of incompatible species or the contractor may be held responsible to re-treat areas that do not meet required results as long as these “touch-up” treatments follow all restrictions in 333 CMR 11.03(8) as listed in the *Control Strategies for Sensitive Area* table in Appendix 5.
- Vegetation management crews will exercise care to insure low-growing compatible vegetation and other non-target organisms are not unreasonably affected by the application of herbicides.
- Unreasonable site damage or destruction during any phase of the vegetation management operation by the contractor, his agents or employees, will be repaired immediately by said contractor to Eversource 's satisfaction.

11. ALTERNATIVE LAND USES

Wherever practical, as determined by the Senior Arborist or Eversource management, Eversource will cooperate with landowners through whose property Eversource owns easements, to facilitate "alternative land use" practices by the landowner's that may reduce or eliminate the need for vegetation management by Eversource. "

Acceptable uses may include an approved lawn or a garden with compatible species of plants approved by Eversource Energy. Any alternative land use proposed by a landowner within an electrical transmission easement must be reviewed by Eversource. Eversource will review a properly submitted proposal and consider conditional approval if the request does not interfere with its operating needs or compromise public safety, and is environmentally sound. The submittal should be addressed to: Supervisor, T & D Rights and Survey, Eversource Energy, Eastern MA, 247 Station Drive, Mail Stop SE210, Westwood, MA 02090. Any approval by the Company is given in the form of a written license only and with the understanding that Eversource's easement rights are in no way diminished nor does the company assume any liability.

12. REMEDIAL SPILL AND EMERGENCY PLAN

Eversource contracts with independent, professional, certified herbicide applicators that are responsible for the containment, clean up and reporting of chemical spills or accidents. The following is a guide to the information sources that, according to various regulations, must be available to the treatment crew in the event of a chemical spill or emergency situation.

TYPES OF CHEMICAL SPILLS THAT REQUIRE ACTION

Chemicals include, but are not limited to the following:

- Herbicides
- Bar and Chain Oil
- Motor & Hydraulic Oil
- Diesel Fuel
- Gasoline
- Title 3 Hazmat Materials

REQUIRED SPILL RESPONSE EQUIPMENT

As a minimum, the ROW crew must have available on the job site:

- VMP and YOP with emergency contact lists
- Safety Data Sheets and product labels
- Product Fact Sheets
- Appropriate absorbent material such as “speedi dri” or “soak up”
- Shovel
- Broom
- Flagging
- Leak proof container
- Heavy-duty plastic bags

PERSONAL CONTACT

In the event of **Personal Contact** with hazardous chemicals:

- Wash affected area with plenty of soap and water
- Change clothing which has absorbed hazardous chemicals
- If necessary, contact a physician
- If necessary, contact the proper emergency services
- If necessary, follow the procedures for Major or Minor Spills as outlined below
- Avoid breathing the fumes of hazardous chemicals

TECHNICAL REFERENCE MATERIALS

A. Herbicide Information

1. Product Label
2. Product Safety Data Sheet (SDS)
3. Product Fact Sheet, if available

B. Table 1. Herbicide Manufacturers:

| MANUFACTURER | TELEPHONE NUMBER | SPECIAL INSTRUCTIONS |
|-------------------------------------|------------------|----------------------|
| Albaugh Inc. | (800) 247-8013 | |
| Bayer Environmental Science | (800) 334-7577 | |
| BASF Corporation | (800) 832-4357 | |
| Dow Agro Sciences | (800) 992-5994 | |
| E.I. du Pont de Nemours and Company | (800) 441-3637 | Medical Emergencies |
| Monsanto | (314) 694-4000 | |
| Nufarm | (877) 325-1840 | Medical Emergencies |

C. Table 2. State Agencies:

| STATE AGENCY | TELEPHONE NUMBER | SPECIAL INSTRUCTIONS |
|---|--|--|
| MDAR, Pesticide Bureau | (617) 626-1700 | A.S.A.P. (within 48 hours) |
| Massachusetts Department of Environmental Protection, Emergency Response Section | DEP 24 Hour Contact: (888) 304-1133 | For emergencies involving reportable quantities of oil or hazardous materials; required info: City/town, street address, site name (if applicable), material |
| | Southeast Region: (508) 946-2700 | |
| | Northeast Region: (978) 694-3200 | |
| | Central Region: (508) 792-7650 | |
| MA Department of Public Health, Bureau of Environmental Health's Environmental Toxicology Program | (617) 339-8351 | |
| Massachusetts Poison Information Centers | (800) 682-9211 | For medical emergencies involving suspected or known pesticide poisoning symptoms |

D. Table 3. Emergency Services:

| EMERGENCY SERVICE | TELEPHONE NUMBER | SPECIAL INSTRUCTIONS |
|--|-----------------------|--|
| Massachusetts State Police, Central Office | (617) 566-4500 or 911 | |
| Local Fire / Police Dept. | 911 | |
| ChemTrec | (800) 424-9300 | |
| Clean Harbors | (800) OIL-TANK | |
| Pesticide Hotline | (800) 858-7378 | PST: 6:30 am – 4:30 pm, Web: www.NPIC.orst.edu |

E. Eversource 's contact in the case of a spill or accident is:

Eversource System Control:
Ops North, (617) 541-7825,
Electric Ops South, (617) 541-7858,

F. Table 4. Local Emergency Numbers:

Emergencies Services for All Municipalities: 911

(to be filled out with the appropriate towns and included in the YOPs)

| Town | Board of Health | Town/City Hall | Town | Board of Health | Town/City Hall |
|------|-----------------|----------------|------|-----------------|----------------|
| | | | | | |

CLEAN-UP PROCEDURES

Education and attention will constantly be directed at accident and spill prevention, however, the following is a guideline in the event of an unfortunate incident:

REPORTABLE SPILLS (Spills of reportable quantity of material): FOLLOW STEPS 1-11

NON-REPORTABLE SPILLS: FOLLOW STEPS 1-4, 7-11 as appropriate & contact the EVERSOURCE representative.

Table 5: HERBICIDE SPILL CHECK LIST

| Order | ACTION | Done (√) |
|-------|---|-------------|
| 1 | Use any and all PPE as directed by product label or SDS. | |
| 2 | Cordon-off spill area to unauthorized people and traffic to reduce the spread and exposure of the spill | |
| 3 | Identify source of spill and apply corrective action, if possible stop or limit any additional amounts of spilled product. | |
| 4 | Contain spill and confine the spread by damming or diking with soil, clay or other absorbent materials. | |
| 5 | Report spills of "reportable quantity" to the Mass. Dept. of Environmental Protection and MDAR: | |
| | MDAR, Pesticide Bureau (617) 626-1700 | |
| | Massachusetts Department of Environmental Protection Emergency Response Section | |
| | MA DEP 24 Contact Number: (888) 304-1133 | |
| | Southeast Region: (508) 946-2700 | |
| | Northeast Region: (978) 694-3200 | |
| | Central Region: (508) 792-7650 | |
| 6 | If the spill cannot be contained or cleaned-up properly, or if there is a threat of contamination to any bodies of water, immediately contact any of the following applicable emergency response personnel: | |
| | local fire, police, rescue 911 | |
| | Eversource: Operations (617) 541-7821 | |
| | Eversource Transmission: William Hayes (781) 441-3932 | |
| | Eversource Distribution - Paul Sellers (508) 957-4603 | |
| | Product Manufactures | |
| | 1. BASF Corporation (800) 832-4357 | |
| | 2. Bayer Environmental Science (800) 334-7577 | |
| | 3. Dow Agro Sciences (800) 992-5994 | |
| | 4. E.I du Pont de Nemours & Company (800) 441-3637 | |
| | 5. Monsanto (314) 694-4000 | |
| | 6. Nufarm (877) 325-1840 | |
| | 7. Rainbow Treecare (877) 272-6747 | |
| | 8. Chemtrec (800) 424-9300 | |
| | 9. additional emergency personnel | |
| | If there is a doubt as to who should be notified, contact State Police, Central Office (617) 566-4500 or 911 | |
| | Remain at the scene to provide information and assistance to responding emergency clean-up crews | |
| | Refer to the various sources of information relative to handling and cleanup of spilled product | |
| 7 | If possible, complete the process of "soaking up" with absorbent materials | |
| 8 | Sweep or shovel contaminated products and soil into leak proof containers for proper disposal at approved location | |
| 9 | Spread activated charcoal over spill area to inactivate any residual herbicide | |
| 10 | | |
| 11 | | |

13. Identification and Qualification of Individual Developing and Submitting the Plan

Identification and qualification of the individual preparing and submitting this VMP, supervision of the IVM program and overall supervision for development and implementation of the VMP is performed by:

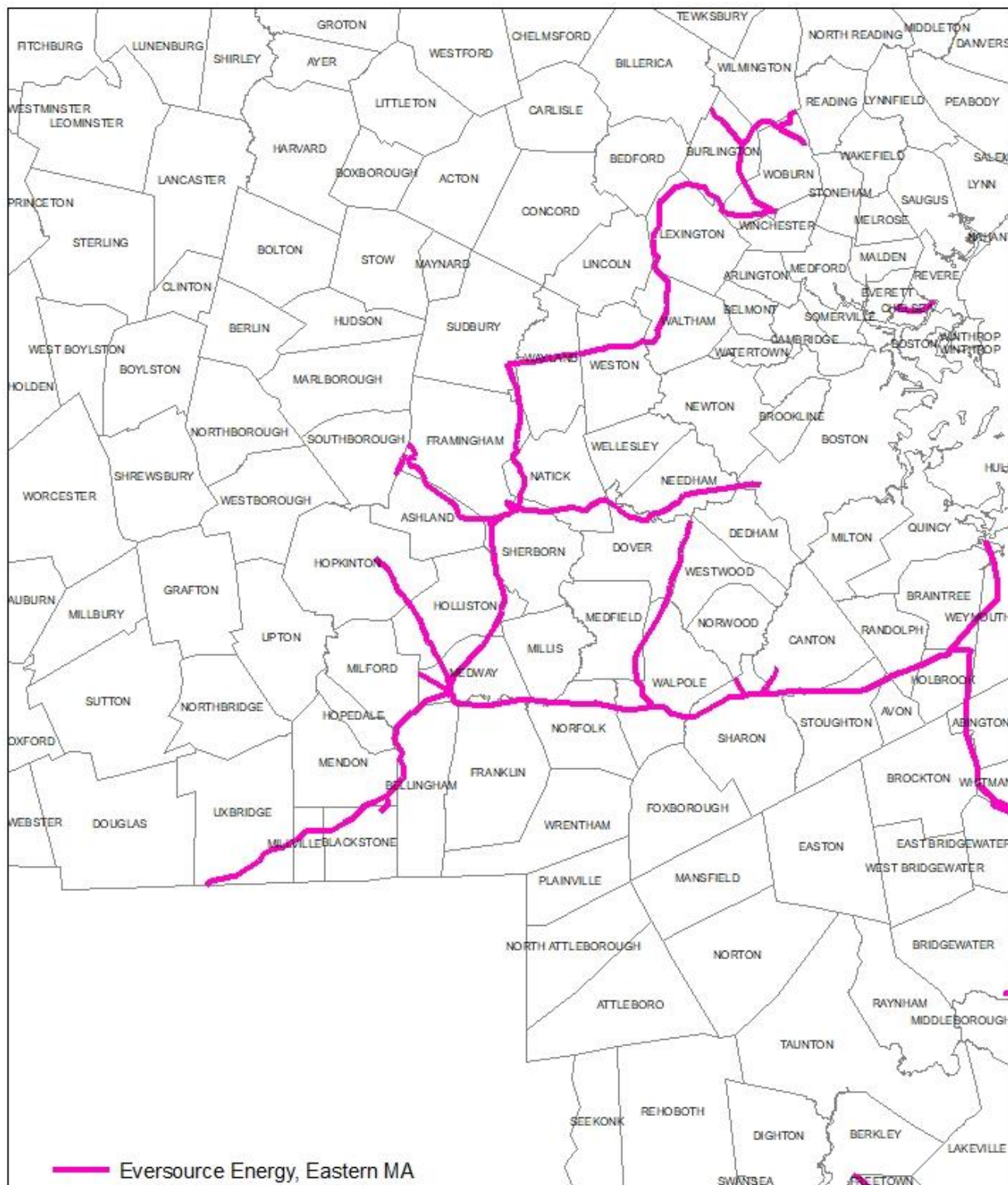
William N Hayes, Jr.
Senior Transmission Arborist
Eversource Energy, Eastern MA
Transmission Vegetation Management
247 Station Drive, SE-370
Westwood, MA 02090-9230

I am ultimately responsible for preparation, implementation of and compliance with this VMP and YOP's to be submitted annually. Responsible for implementing the vegetation management programs best practices on transmission, and distribution systems. I develop and evaluate methods for vegetation management to ensure transmission and distribution system reliability follows regulations and standards. Provide work scheduling, prescription of herbicides and application methods, procurement of necessary permits, municipal notifications, contractor selection, provision of technical expertise and liaison between Company right-of-way easement landowners, neighbors, local and state officials and other interested parties and field supervision of vegetation management contractors and Eversource arborists.

My qualifications extend from my education to over 30 years of work related to utility arboriculture. I have a Bachelor of Science, Majoring in Forestry Management with concentration in Arboriculture/Urban Forestry from the University of Massachusetts. Credentials include Massachusetts Certified Arborist, International Society of Arboriculture Certified Arborist, Massachusetts Category 40 Pesticide License, Consumers Power Co. Certified Basic Tree Trimmer. I am member of the Massachusetts Arborist Association, Massachusetts Tree Wardens & Foresters Association, Southeastern Tree Wardens & Arborist Association, Utility Arborist Association and the International Society of Arboriculture.

APPENDIX 1:

EVERSOURCE ENERGY
CENTRAL, EASTERN AND SOUTHEASTERN
MASSACHUSETTS
ELECTRIC SYSTEM MAPS



Eversource Energy Eastern, MA System Map

Map 1 of 2



1:400,000

0 2.5 5 7.5 10 Miles

APPENDIX 2:
EVERSOURCE ENERGY
CENTRAL, EASTERN AND SOUTHEASTERN
MASSACHUSETTS
LIST OF MUNICIPALITIES

| MUNICIPALITIES | | |
|------------------|---------------|------------|
| ABINGTON | FRAMINGHAM | NORFOLK |
| ACTON | FRANKLIN | PEMBROKE |
| ACUSHNET | FREETOWN | PLYMOUTH |
| ARLINGTON | HALIFAX | PLYMPTON |
| ASHLAND | HANSON | RANDOLPH |
| AVON | HOLBROOK | ROCHESTER |
| BEDFORD | HOLLISTON | SHARON |
| BELLINGHAM | HOPKINTON | SHERBORN |
| BLACKSTONE | KINGSTON | SOMERVILLE |
| BOSTON | LEXINGTON | STOUGHTON |
| BRAINTREE | LINCOLN | SUDBURY |
| BRIDGEWATER | MARION | UXBRIDGE |
| BROCKTON | MARSHFIELD | WALPOLE |
| BROOKLINE | MATTAPOISETT | WALTHAM |
| BURLINGTON | MAYNARD | WATERTOWN |
| CAMBRIDGE | MEDFIELD | WAREHAM |
| CANTON | MEDWAY | WAYLAND |
| CARLISLE | MENDON | WESTON |
| CARVER | MIDDLEBOROUGH | WESTPORT |
| CHELSEA | MILLIS | WESTWOOD |
| DARTMOUTH | MILLVILLE | WEYMOUTH |
| DEDHAM | MILTON | WHITMAN |
| DOVER | NATICK | WILMINGTON |
| DUXBURY | NEEDHAM | WINCHESTER |
| EAST BRIDGEWATER | NEW BEDFORD | WOBURN |
| FAIRHAVEN | NEWTON | |

APPENDIX 3:
333 CMR 11.00

[HTTPS://WWW.MASS.GOV/LAW-LIBRARY/333-CMR](https://www.mass.gov/law-library/333-cmr)

APPENDIX 4:
CHAPTER 132B

[HTTPS://MALEGISLATURE.GOV/LAWS/GENERALLAWS/PARTI/TITLEXIX/CHAPTER132B](https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXIX/Chapter132B)

APPENDIX 5:
SENSITIVE AREA TABLE

CONTROL STRATEGIES FOR SENSITIVE AREAS

| <i>Sensitive Area</i> | No-Spray and Limited Spray Areas (feet) | Control Method | Restriction Code |
|---|--|---|------------------|
| Public Ground Water Supplies | 400' | Mechanical Only | None |
| Primary Recharge Area | Designated buffer zone or 1/2 mile radius | Mechanical, Recommended Herbicides* | 24 months |
| Public Surface Water Supplies (Class A & Class B) | 100' | Mechanical Only | None |
| | 100'-400' | Recommended Herbicides | 24 months |
| Tributary to Class A Water Source, within 400' upstream of water source | 100' | Mechanical Only | None |
| | 100'-400' | Recommended Herbicides | 24 months |
| Tributary to Class A Water Source, greater than 400' upstream of water source | 10' | Mechanical Only | None |
| | 10'-200' | Recommended Herbicides | 24 months |
| Class B Drinking Water Intake, within 400' upstream of intake | 100' | Mechanical Only | None |
| | 100'-200' | Recommended Herbicides | 24 months |
| Private Drinking Water Supplies | 50' | Mechanical Only | None |
| | 50'-100' | Recommended Herbicides | 24 months |
| Surface Waters | 10' | Mechanical Only | None |
| | 10'-100' | Recommended Herbicides | 12 months |
| Rivers | 10' from mean annual high water line | Mechanical Only | None |
| | 10'-200' | Recommended Herbicides | 12 months |
| Wetlands | 100' (treatment in wetlands permitted up to 10' of standing water)*+ | Low-pressure Foliar, CST, Basal Recommended Herbicides | 12 months |
| Inhabited Areas | 100' | Recommended Herbicides | 12 months |
| Agricultural Area (Crops, Fruits, Pastures) | 100' | Recommended Herbicides | 12 months |
| Certified Vernal Pools | 10' | Mechanical Only when water is present | None |
| Certified Vernal Pool Habitat | 10'-outer boundary of habitat | No treatment without written approval per 321 CMR 10.14(12) | |
| Priority Habitat | No treatment without written approval per 321 CMR 10.14(12) | | |

Restrictions "24 Months": A minimum of twenty-four months shall elapse between applications

"12 Months": A minimum of twelve months shall elapse between applications

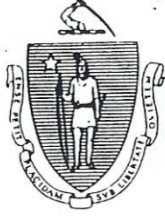
*Massachusetts recommended herbicides for sensitive sites

+Per the *DFA Decision Concerning the Wetlands Impact Study* for utilities per 333 CMR 11.04(4)(c)(2).

APPENDIX 6:
PREFACE TO 310 CMR 10.00

[HTTPS://PIPEPORTAL.KINDERMORGAN.COM/PORTALUI/DOWNLOADDOCS/PASSKEY
/ENVIRONMENTAL/APPENDIX6/450-453OFREFACETO310CMR.PDF](https://pipeportal.kindermorgan.com/portalui/downloaddocs/paskey/environmental/appendix6/450-453ofprefaceto310cmr.pdf)

APPENDIX 7:
WETLANDS STUDY



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF FOOD AND AGRICULTURE

100 CAMBRIDGE ST., BOSTON, MA 02202 617-727-3000 FAX 727-7235

WILLIAM F. WELD
Governor

ARGEO PAUL CELLUCCI
Lt. Governor

**Decision Concerning
The Wetland Impact Study Conducted
Pursuant to 333 CMR 11.04(4)(c)(2)**

TRUDY COXE
Secretary

JONATHAN L. HEALY
Commissioner

**PUBLIC UTILITY VEGETATION
MANAGEMENT PROGRAM FINDING**

Background

The Rights of Way Management (ROW) Regulations (333 CMR 11:00) promulgated in 1987 prohibit the use of herbicides to control vegetation along utility right of ways on or within ten (10) feet of a wetland unless the following conditions are met:

1. Submission of a study, the design of which is subject to prior review and approval of the Departments of Food and Agriculture and Environmental Protection, evaluating impacts of proposed vegetation management programs on wetlands; and
2. A finding by the Department, after consultation with the Advisory Committee, that the proposed vegetation management program will result in less impacts to the wetland than mechanical control.
3. Notwithstanding the above, no herbicides shall be applied on or within ten feet of any standing or flowing water in a wetland.

On April 28, 1988, The Departments of Food and Agriculture and Environmental Protection approved the scope of the study. In the fall of 1989, Environmental Consultants, Inc. submitted to the Department of Food and Agriculture the study entitled, "Study of the Impacts of Vegetation Management Techniques on Wetlands for Utility Rights-of Way in the Commonwealth of Massachusetts", dated June 1989. The Department consulted with the Vegetation Management Plan (VMP) Advisory panel at their November 15, 1989, December 7, 1989 and August 1, 1991 meetings.

The study provided some broad information of vegetation control along utility right of ways. The Department based its finding solely upon the narrow scope of whether the "proposed vegetation management program will result in less impacts to the wetland than mechanical control."

The following are the major evaluation points the Department considered in reaching its decision.

What are the Long-term and Short-term Impacts From Herbicide use and Mechanical Control?

Since wetlands are not a static, unchanging resource, there is some difficulty in determining the actual long-term impacts from the various vegetation control practices. The extent of wetland alterations must be the most important factor in determining impacts. With limited or selective removal of unwanted plant species in specific locations, it appears that long-term impacts are negligible. While mowing or foliar application can damage non-target species, neither control practice appears to result in adverse long-term impacts if they are carefully executed. Clear cutting, however, has a greater impact on wetlands since both wanted and nuisance species are removed.

Although there were some reservations about the sites that were chosen to determine the level of chemical residues, the study did show that there was not a buildup of background residues of herbicides applied from previous practices. However, there were some trace amounts of petroleum products - bar oil or hydraulic fluid found. The source of these petroleum products is unclear and may have been the result of public activities not related to vegetation management. Retrospective analyses for herbicide residues in previously treated wetland areas is not generally applicable since the herbicides used today are less persistent than those which were used previously. However, these analyses did indicate that the herbicides used in the past do not persist in the environment.

The study clearly demonstrated that adjacent non-controlled wetland areas did not differ significantly in composition and abundance of plant species from the controlled areas. The control practices did not appear to impact the entire wetland ecosystem, since a long-term comparison of wetland plant species composition between controlled and non-controlled sites did not differ significantly. Therefore, the long-term effects on the entire wetland ecosystem were considered negligible.

The determination of the short-term impacts to the wetland from the control practices was the most noted short-coming of the study. However, this was not part of the original scope. The VMP Advisory Panel felt, and the Department agreed, that a short-term environmental fate study would be needed.

The first study indicated that certain mechanical control practices can impact wetlands and disrupt the ecosystem to a greater extent than the judicious use of herbicides. While cutting may result in re sprouting of some unwanted vegetation in a manner unlikely to be encountered in unaltered wetland areas, unregulated mechanical vegetation control could result in the destruction of other non-target plant species.

What is the Impact to Non-target Wetland Plant Communities?

Basal and cut stump treatment with low mobility, short persistence herbicides that are judiciously applied usually do not impact adjacent plant species. Likewise careful selective mechanical cutting (versus mowing or clear cutting) also usually does not impact non-target wetland plants. The greatest potential risk to non-target wetland plants comes from mowing, clear-cutting, and high volume foliar applications. Low volume foliar applications in wetlands may also cause non-target impacts if application guidelines are not followed (e.g. no applications during high winds, or without using anti-drift agents, etc.).

Is There Enough Information on Which to Base a Finding?

As in most environmental assessments, a complete database is not available to answer all of the questions posed by the Department and the Vegetation Management Advisory Panel. Some of the questions posed were entirely valid, but were beyond the scope of the approved study.

The study did provide some clear evidence that selective mechanical and herbicide use does minimally alter wetlands by removing specific plant species. Mechanical mowing operations, however, can result in far greater short-term and potentially long-term impacts to wetlands since both wanted and un-wanted plant species are indiscriminately removed. Additionally, foliar herbicide applications may cause short-term impacts to non-target species.

The Department did not find any significant difference in wetland impacts between careful mechanical removal (selective hand cutting) of unwanted species

and, cut stump or basal treatment with herbicides.

There is no assurance that prohibiting the use of herbicides in wetlands will result in careful mechanical control. If herbicide use is prohibited in wetland areas, mechanical control in wetlands will be the only practice available to utilities. Financial pressures and other considerations may force Utilities to increase mowing and / or the use of more destructive non-chemical control practices due to a lack of alternative control techniques.

On August 29, 1991, the Department made a finding that the submitted study met the approved scope. However, although the study contained useful information, it was also determined that additional data needed to be gathered and analyzed because the study was inconclusive in a number of instances.

The Department issued a finding that a proposed vegetation program containing the specific elements listed does not pose an unreasonable adverse impact to wetlands. In addition, the Department required a study be conducted to provide important environmental fate data necessary for the long-term implementation of the rights of way program.

AUGUST 1991 FINDING

The Department of Food and Agriculture finds that a proposed vegetation program containing the following elements will not pose an unreasonable adverse impact to wetlands:

1. *The Integrated pest Management (IPM) system, as described in the Vegetation Management Plan and Yearly Operation Plan, is utilized in wetland areas. The IPM system must, at a minimum, place emphasis on encouraging low growth plant species to discourage unwanted vegetation and, minimizing the frequency and amount of herbicide use by only controlling specific non-conifer tree species which will impact transmission line operation and access to the right of way.*
2. *Herbicides may be applied by basal, cut stump or low volume foliar methods. Foliar applications must include the use of drift reduction agents. Foliar applications may only be conducted in situations where basal and cut stump treatments are not appropriate based on the size of the vegetation and potential for off-target drift. Foliar applications must not result*

in the off-target drift to non-target species.

3. *Herbicides are not applied to conifer species (pine, spruce, fir, cedar and hemlock).*
4. *Carriers for herbicides do not contain any of the following petroleum based products: jet fuel, kerosene or fuel oil. Carriers will be subjected to review by the Department of Food and Agriculture and DEP through 333 CMR 11.04(1)(d).*
5. *Herbicides must be recommended by the Department of Food and Agriculture and DEP through 333 CMR 11.04(1)(d).*
6. *Herbicides may only be applied by hand operated equipment containing no more than 5 gallons of diluent.*
7. *All other restrictions within sensitive areas remain in effect. In accordance with 333 CMR 11.04(1)(c), no person shall apply herbicides for the purposes of clearing or maintaining a right-of-way in such a manner that results in drift to any areas within 10 feet of standing or flowing water in a wetland or area within 400 feet of a public drinking water supply well; or area within 100 feet of any surface water used as a public water supply; or area within 50 feet of a private drinking water supply identified under 333 CMR 11.04(2)(c)(3).*
8. *Approved Vegetation Management Plans and Yearly Operation Plans must be amended as needed to reflect the conditions of this FINDING.*
9. *The Department further requires that environmental fate data be provided by the utilities that are applying herbicides to rights-of-way, which characterizes the movement of herbicides applied to wetland areas under these conditions. The Department further requires that all study protocols be reviewed by the Vegetation Advisory Panel and be approved by the Department of Food and Agriculture and the Department of Environmental Protection. Failure to submit the required information by the dates outlined in the schedule below will render this finding void.*

An approvable scope of the study developed and

submitted by January 1, 1992.

Field data submitted to DFA by October 1, 1992. Data must be consistent with the requirements of the approved scope.

Draft study report submitted to DFA by October 1, 1993.

Final Report submitted to DFA by March 1, 1994.

10. *The Department reserves the right to amend or withdraw its FINDING at anytime if it determines that the use of herbicides in wetland areas poses a greater impact than mechanical control or may pose an unreasonable adverse effect to humans or the environment.*
11. *This finding expires December 31, 1994.*

Therefore, herbicide use may be allowed to control certain vegetation along utility right of ways if the proposed vegetation program as described in the approved Vegetation Management Plan and Yearly Operational Plans contains the above elements.

On, April 27, 1992, the Departments of Food and Agriculture and Environmental Protection approved the scope of the "*Study of Fates of Herbicides in Wetlands on Electric Utility Rights of Way in the Massachusetts Over the Short Term*". The final report was submitted to the Department of Food and Agriculture December 31, 1993. The Department began reviewing the report in consultation with the VMP Advisory panel.

At the end of 1994, the Department had not completed its review. Therefore, on December 22, 1994 the Department extended the current finding for one year (to December 31, 1995) or until such time it is able to make a final determination, whichever occurs first.

Fates of Herbicides Over the Short Term Study

The objective of this study was to determine the short term environmental fate and assess the impacts of selected herbicides applied by four common Right-of-Way management techniques. Additionally, the study evaluated which of the four Right-of-Way management techniques provides the most effective control of target vegetation and which techniques produced the least impact on the non-target plant community, and consequently the least alteration of wooded wetland community.

The study investigated the environmental fate of two herbicides, which are typically used to control vegetation on ROWs, and are included in the list recommended for use in sensitive areas. These herbicides were chosen, among other reasons, for their use patterns, size of area treated, and application rates. Accord, which contains the active ingredient glyphosate, is the primary herbicide used for cut stump treatment and is also used for foliar application. Garlon 4, which contains the active ingredient triclopyr, is the primary herbicide used for basal applications. Collectively these products represent the typical herbicides used to control vegetation on ROWs.

Results

A summary of the most important findings and conclusions of the study include:

* Based upon the samples collected immediately after application, at 1 week, 1 month, 3 months and 1 year:

- The two herbicides, glyphosate and triclopyr degrade rapidly. Residues reach low quantities quickly, often less than detection limits, within a year.; and
- There is essentially no movement either laterally or vertically from the treated sites by glyphosate. Triclopyr does not move laterally, but was noted to move vertically in small amounts.

* Drift cards indicate that the herbicides are neither splashed nor carried any distance by the wind. Glyphosate drift is not a significant problem resulting in slight effects on neighboring vegetation and are not detectable in the next year's growth. Sphagnum moss next to trunks treated basally with triclopyr were killed within three months in a 15 cm diameter circle immediately around the target tree, but the dead circle did not continue to enlarge.

* Filter paper recovered immediately after application of herbicide showed that all methods of application deposit herbicide on the ground. Treated bare soil samples showed as consistent a drop in herbicide concentrations and as little vertical movement as did samples beneath target trees.

* The use of the herbicides glyphosate and triclopyr at the strengths and application rates used does not pose a risk of accumulation in organically rich soils.

* Herbicide concentrations in soil continue to decline as time advances.

* Rainfall occurring more than a week after application does not appear to spread the herbicide nor does groundwater carry any substantial fraction of what has been applied to a particular site down into the soil or horizontally.

* Based upon the results of the study, an assessment of the environmental fate, and observations of both treatment effectiveness and non-target impacts, an effective and environmentally sensitive ranking from most effective and posing least potential environmental risks to least effective and posing the most environmental risk is suggested:

1. Most effective control and exclusive effect on target:
low-volume foliar (with glyphosate).
2. Most consistent control with lethal effects on bordering vegetation:
high-volume foliar (with glyphosate)
3. Total control with rings of dead vegetation around treated trunks:
low-volume basal (with triclopyr)
4. Incomplete target control and leaving largest soil residues:
cut-stump (with glyphosate)

It is important to note that the results of the second short term study suggest that the most efficacious application techniques and which pose the lowest environmental risk were not those recommended in the interim finding.

DEPARTMENT DETERMINATION

Based upon the results of the two ROW impact studies, the general information in the literature, and after consultations with the Vegetation Management Panel, the Department finds that the following proposed vegetation management program will result in less impacts to wetlands than exclusive use of mechanical control methods. Therefore, the Department finds that any vegetation management program that incorporates the conditions under which the study was conducted as well as taking into account the results of previous studies, will result in the least impacts to wetlands.

These conditions include:

1. An Integrated Pest Management (IPM) system, also known as Integrated Vegetation Management (IVM), as described in the Vegetation Management Plan and Yearly Operation Plan is utilized in wetland areas. The IPM system must, at a minimum, place emphasis on encouraging low growth plant species to discourage unwanted vegetation and, minimizing the frequency and amount of herbicide use by only controlling specific non-conifer tree species which will impact transmission line operation and access to the right of way.
2. Herbicides may be applied by low volume foliar, basal, or cut stump methods. Foliar applications must include the use of appropriate drift reduction agents, and must not result in the off-target drift to non-target species. Basal and cut-stump treatments may be conducted in those situations where the size of the vegetation, potential for off-target drift, or other considerations precludes the use of low-volume foliar applications. Cut stump and basal applications shall be restricted, when practicable, to periods when static ground water levels are low or otherwise when conditions are less susceptible to potential contamination.
3. Herbicides are not applied to conifer species (pine, spruce, fir, cedar and hemlock).
4. Carriers for herbicides do not contain any of the following petroleum based products: jet fuel, kerosene or fuel oil. Carriers will be subjected to review by the Department of Food and Agriculture and DEP through 333 CMR 11.04(1)(d).

5. Only herbicides recommended by the Departments of Food and Agriculture and Environmental Protection through 333 CMR 11.04(1)(d) may be used in sensitive areas.
6. Herbicides may only be applied by hand operated equipment containing no more than 5 gallons of diluent.
7. All other restrictions within sensitive areas remain in effect. In accordance with 333 CMR 11.04(1)(c), no person shall apply herbicides for the purposes of clearing or maintaining a right-of-way in such a manner that results in drift to any areas within 10 feet of standing or flowing water in a wetland or area within 400 feet of a public drinking water supply well; or area within 100 feet of any surface water used as a public water supply; or area within 50 feet of a private drinking water supply identified under 333 CMR 11.04(2)(c)(3).
8. A minimum of twelve months must elapse between herbicide treatments. Only touch-up applications may be performed between twelve and twenty four months.
9. Approved Vegetation Management Plans and Yearly Operation Plans must be amended as needed to reflect the conditions of this determination.

.....

Therefore, herbicide use may be allowed to control certain vegetation along utility right of ways if the proposed vegetation program as described in the approved Vegetation Management Plan and Yearly Operational Plans contains the above elements.



Jonathan Healy, Commissioner

10/12/95
Date

APPENDIX 8:
CHAPTER 85, SECTION 10

[HTTPS://MALEGISLATURE.GOV/LAWS/SESSIONLAWS/ACTS/2000/CHAPTER85](https://malegislature.gov/Laws/SessionLaws/Acts/2000/Chapter85)

APPENDIX 9:
REFERENCES

REFERENCES

SENSITIVE MATERIALS LIST:

A current list of the *Sensitive Area Materials List* and individual *Fact Sheets* on these herbicides are available at:

<http://www.mass.gov/eea/agencies/agr/pesticides/rights-of-way-vegetation-management.html>

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